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ABSTRACT

The Drug Abuse Reporting Program (DARP) was initiated in 1969 as a federally supported client reporting system for community-based drug abuse treatment programs. Posttreatment follow-up interviews were conducted with over 4,000 persons from 34 treatment agencies to describe major findings from the drug abuse treatment research of the DARP relating to treatment effectiveness and client functioning in the community. Results indicated that effective results had been attained by treatments such as methadone maintenance and therapeutic community and outpatient drug-free programs. Both performance during treatment and length of time spent in treatment were positively related to outcome. The data from the replicated studies and the overall consistency of DARP findings demonstrate the strong connection between treatment and posttreatment outcomes. (JAC)

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TREATMENT RESEARCH REPORT

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Evaluation of Drug Abuse Treatment Effectiveness:

Summary of the DARP Followup Research

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CG 016183

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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FOREWORD

The Drug Abuse Reporting Program (DARP) followup research comprises the most important drug abuse treatment outcome study to date. Based on a large national sample of clients admitted to treatment during 1969-1973, this work has produced a wealth of findings that address issues of treatment effectiveness and various aspects of posttreatment client functioning in the community. This report provides a concise summary of major findings organized around presentations of key data, as well as a useful guide to the large number of published books, monographs, articles, and research reports that have been produced by the research team at Texas Christian University.

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Treatment Research and Assessment Branch
Division of Prevention and Treatment Development
National Institute on Drug Abuse

Evaluation of Drug Abuse Treatment Effectiveness:

SUMMARY OF THE DARP FOLLOWUP RESEARCH

D. Dwayne Simpson and S.B. Sells

INTRODUCTION

In 1969 the Institute of Behavioral Research (IBR) of Texas Christian University initiated a federally supported client reporting system for community-based drug abuse treatment programs, which has become widely known as the Drug Abuse Reporting Program (DARP). This system was created to serve as a data base for treatment outcome evaluation research and began receiving reports from six programs in June 1969. Additional treatment programs were added over a 4-year period until reporting of new admissions was discontinued in March 1973. The DARP included a majority of the federally supported treatment programs up until the year before it was discontinued; by this time, there was a total of over 200 programs in the Federal drug abuse treatment system. The final DARP computerized file included 43,943 clients admitted to treatment in 52 programs throughout the United States and in Puerto Rico. Most of these programs have continued to operate throughout the last decade during the DARP posttreatment followup phases.

The total DARP population was divided by date of admission into three cohorts (1969-1971, 1971-1972, and 1972-1973) for purposes of the research. Admission and bimonthly status reports throughout treatment were collected prospectively until March 1974 and were the basis for an extensive series of outcome studies. This research was replicated on each of the cohorts and took into account client characteristics, treatment experience, and outcomes during the time that clients were in treatment (i.e., up to termination from treatment). The during-treatment research reports were published in five volumes (Sells 1974a,b; Sells and Simpson 1976a,b,c) and descriptions of the overall program and its rationale were presented in several papers (Sells and Associates 1975; Sells et al. 1977).

Prior to the termination of the reporting of additional DARP admissions, planning was initiated for an important new research phase that involved posttreatment followup studies of samples of DARP clients. This followup evaluation research began in 1974 and has continued over a period of approximately 7 years. It was carried out in separate stages in order to replicate findings on successive DARP admission cohorts. On the average, the followup samples of relocated DARP treatment clients were interviewed 5 to 7 years after admission to, and over 4 years after termination from, treatment received under the DARP.

Conceptually, the DARP research is based on a prospective data acquisition process focused on community-based treatment programs. In order to retain a naturalistic approach to the assessment of program service delivery, the routine operating procedures of these clinics were not altered as part of this field-based evaluation project. This approach was contrary to traditional experimental intervention into the treatment process that involves the random assignment of clients to treatment.

The present paper was taken from a longer and more comprehensive report of the DARP followup research.

Such experimental intervention would have been unacceptable to the individual treatment clinics participating in the system. The research orientation emphasized realism and conformity to ongoing clinical and sociological practices in the therapeutic process. In particular, the operating clinical opinions by the treatment specialists were allowed to prevail under the naturalistic research strategy used, and data collection efforts were designed to document and evaluate the client treatment transactions that occurred in the system. (See Sells et al. 1977 and Sells and Simpson 1980 for further methodological discussion of the DARP research.)

The purpose of this paper is to describe and summarize the major findings from the drug abuse treatment evaluation research based on the DARP. In particular, it focuses on the results reported in a series of about 50 separate studies that have been completed on different aspects of the posttreatment followup research for this project. Although many related details could not be included, all operant papers are cited and a complete bibliography of the DARP research reports is included.

METHOD

Posttreatment followup interviews were completed with a subset of 4,627 persons from 34 treatment agencies. Overall, 83 percent of the original target sample were located; 73 percent were interviewed after granting informed consent, 5 percent were verified to be deceased, 1 percent were out of the country (mainly due to military service), and 4 percent exercised their right to refuse to be interviewed. The remaining 17 percent could not be located within the time and resources allocated for this purpose. Comparisons based on DARP admission records and during-treatment records suggested that sampling bias associated with the nonlocated clients was small (Simpson et al. 1979c).

Face-to-face followup interviews were conducted by trained interviewers who followed strict procedures to protect the confidentiality of the respondents. The average duration of each interview was approximately 75 minutes, and respondents were paid $10 for their participation. The interview focused on living arrangements, employment activities, criminality, drug use, alcohol consumption, and return to treatment. The data were retrospective self-reports of the month-by-month activities of the respondents from the time of termination from the DARP treatment program to the time of the followup interview. In the followup studies of the first two cohorts, a high level of reliability and validity of the data was indicated by (1) checks for internal consistency within subjects and (2) comparisons of the self-report information with treatment reentry records and criminal justice records of post-DARP incarceration (Simpson et al. 1976).

The combined followup sample for the three DARP admission cohorts included clients from methadone maintenance programs (MM), therapeutic communities (TC), outpatient drug free treatments (DF), and outpatient detoxification clinics (DT); it also included a comparison group, labeled intake only (IO), that completed admission (intake) procedures but did not return to receive treatment in the DARP. The IO clients represented an important comparison group for purposes of the evaluation research, but did not constitute a control group since random assignment was not followed in the DARP programs.

Some of the data to be presented later are based on black and white male addicts and nonaddicts. Daily use of opioid drugs (including heroin, illegal methadone, or other opioids) --either during the 2-month baseline period before DARP admission or any time prior to that--qualified a person as an "opioid addict." These persons were separated into two categories. Active addicts referred to individuals who used opioid drugs daily in the 2-month pre-DARP period. (Heroin accounted for almost all of the opioid use reported.) Over half of these persons used nonopioid drugs as well. Former addicts referred to individuals who had a history of daily opioid use but did not use them daily in the 2-month pre-DARP period. Most former addicts still used opioid drugs less than daily during the pre-DARP baseline period and over half used nonopioid drugs. Finally, persons who had never used opioid drugs daily were classified as nonaddicts, even though it was recognized that they may have been physically dependent on other nonopioid drugs. Less than a fourth of these individuals reported any opioid drug use during the 2 months before admission to DARP, although about half had previously experimented with opioids. Demographic characteristics and pre-DARP drug use are described in table 1 for the three subsamples. (It is noted that this followup sample includes no persons who used only marijuana during the pre-DARP baseline period; all persons were current users of one or more drugs other than marijuana.)

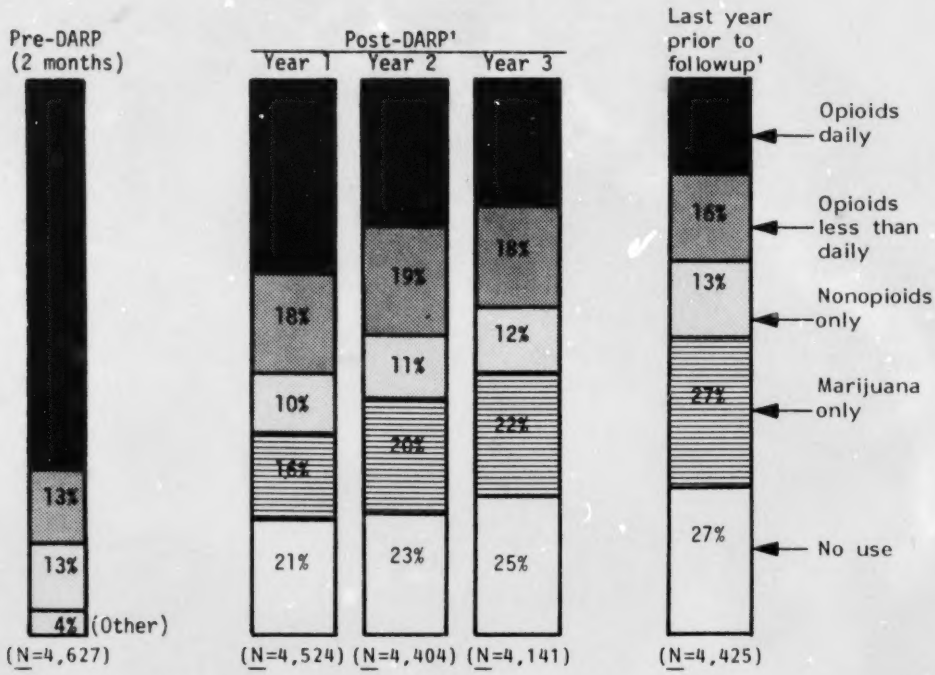
Each of the categories of drug users was found to have characteristically different posttreatment outcomes, and therefore the categories have been analyzed separately

TABLE 1.--Description of the sample

	Pre-DARP		
	Current addicts (percent) (N=3,248)	Former addicts (percent) (N=742)	Nonaddicts (percent) (N=637)
Age at admission to DARP:			
Under 18	4	9	39
18-21	28	31	34
22-25	28	29	17
26-30	19	16	4
Over 30	21	15	6
Racial-ethnic status:			
Black	53	41	22
Mexican-American	5	1	0
Puerto Rican	4	1	0
White	38	57	78
Sex:			
Male	74	78	59
Female	26	22	41
DARP treatment group:			
MM	51	27	0
TC	22	41	31
DF	11	21	57
DT	10	5	3
IO	6	6	9
History of opioid use:			
Never used	0	0	55
Used less than daily	0	0	45
Used daily	100	100	0
Drug use in 2 months pre-DARP:			
Opioids			
Daily	100	0	0
Less than daily	0	64	23
None	0	36	77
Nonopioids[1]			
Daily	9	18	29
Less than daily	45	35	56
None	46	47	15
Any barbiturate use	25	29	53
Any cocaine use	37	21	20
Any amphetamine use	13	21	45
Any hallucinogen use	8	15	41
Any marijuana use	48	51	76
Any other drug use	1	5	7

[1]Does not include marijuana use.

FIGURE 1.--Changes in illicit drug use over time



¹Drug use based on the maximum frequency of use during any month in the year.

(Sells et al. 1979; Simpson et al. 1980). Since black and white males were the only clients consistently represented in all treatment groups surveyed in the DARP followup samples (due to population constraints described by Simpson and Joe 1977 and Simpson et al. 1979a), many of the analyses were necessarily restricted to this client subsample. Two-thirds (66 percent) of the total interviewed sample of 4,627 were black and white males, and 69 percent of all black and white males (N=2,099) were active addicts at the time of DARP admission.

DARP POSTTREATMENT FOLLOWUP RESULTS

Changes in Illicit Drug Use Over Time

The primary outcome measure in the assessment of drug abuse treatment is illicit drug use. Other outcomes are important, but they assume significance primarily in relation to changes in drug use behavior. Figure 1 summarizes drug use information for the total DARP followup sample (for all DARP treatments, in all three cohorts combined) from

pre-DARP to the post-DARP followup, including years 1, 2, and 3 after each individual's termination from DARP and the last full year before the followup interview. Drug use categories are defined according to the level of opioid, nonopioid, and marijuana use, respectively, and are presented for each of these time periods.

Pre-DARP drug use was based on the 2 months before admission to treatment (generally representing a time of peak use), and it is important to emphasize that there were no marijuana-only users included. As shown in figure 1, the sample was classified into users of opioids daily (including daily users of heroin, illegal methadone, or other opiates), opioids less than daily (i.e., persons whose usage pattern included at least some opioid drugs, but not daily use, as well as some nonopioid drugs in most cases), and nonopioids only (i.e., persons whose use was restricted to nonopioid drugs other than marijuana). A small percentage is also shown in the other group, which includes persons with incomplete drug use data.

Post-DARP drug use was classified on the basis of the maximum level of illicit drug use reported (during 1 or more months) in each year shown. The same major categories defined above for pre-DARP use were employed, along with two additional categories --marijuana only and no use of any illicit drugs. The sample sizes, shown in parentheses across the bottom of the figure, represent individuals who were at risk in each period.

Comparisons of these data for the pre-DARP and post-DARP time periods involve different intervals (2 months for pre-DARP versus 1 year for post-DARP). Changes represented in drug use from the 2-month pre-DARP baseline may therefore be conservative, compared to those that would be expected if a 12-month baseline period had been employed instead. Nevertheless, data were only available for 2 months pre-DARP, and this period is believed to represent a time of peak drug use (and problems) of clients. The major findings in these data may be summarized as follows.

- For the total system--that is, all treatments combined--daily use of opioid drugs (either with or without nonopioid drugs) dropped from 70 percent before DARP admission to 35 percent, 27 percent, and 23 percent during the 3 successive years following DARP termination.

- The percentages of users of opioids less than daily and of users of nonopioids only remained relatively stable from pre-DARP to post-DARP (i.e., ranging from 13 percent to 19 percent, and 10 percent to 13 percent, respectively), possibly serving as transitional drug use stages associated with shifts from daily opioid use to no use or to marijuana only.

- During post-DARP year 1, 16 percent used marijuana only and 21 percent reported no illicit drug use; these percentages increased to 22 percent and 25 percent, respectively, in year 3 as the percentage who used opioids daily dropped during the same time. (Approximately one-fourth of the marijuana-only users were daily users.)

- In the last year before the followup interview, which represents on the average about 6 years after DARP admission, 27 percent of the sample reported no illicit drug use and an additional 27 percent reported use of marijuana only; 17 percent used opioids daily, 16 percent used opioids less than daily, and 13 percent used other nonopioid drugs. A clear trend toward a less severe drug use status over the post-DARP years is apparent in figure 1.

Effectiveness of Treatment Modalities

The effectiveness of different treatment modalities has been addressed in a number of studies. Based on the followup samples from the DARP cohorts 1 and 2, Sells et al. (1978) analyzed data for the first 3 years following termination of treatment; Simpson et al. (1977) analyzed data for the first year post-DARP; and Simpson et al. (1979b) analyzed data for the first month. In addition, replication of the cohort 1 and 2 research was carried out on the cohort 3 sample by Simpson et al. (1980). Considering the different methodologies employed in these studies, and changes in client composition as well as in the social milieu over the years covered, the consistency of results for the samples was high and provided strong support for the generalization of the findings.

Because of client population differences between modalities with regard to drug use histories and patterns of use at the time of admission, methodological considerations (i.e., statistical adjustments and analysis by separate drug use groups) were necessary before making comparisons between the DARP treatment groups. Adjustment for client drug use and other differences at admission was accomplished in several ways--statistically (e.g., by analysis of covariance) and also by disaggregation of the samples into more homogeneous subgroups (e.g., opioid addicts and nonaddicts).

TABLE 2.--Individual outcome measures for active opioid addicts before and after DARP, by DARP treatment groups (based on black and white males)

	Treatment group (percent)				
	MM (N=895)	TC (N=582)	DF (N=256)	DT (N=214)	IO (N=152)
Daily opioid use:					
Pre-DARP[1]	100	100	100	100	100
Post-DARP					
Year 1	36	39	44	64	53
Year 2	29	32	33	48	40
Year 3	24	26	28	37	41
Last year	22	18	19	28	29
Any opioid use:					
Pre-DARP[1]	100	100	100	100	100
Post-DARP					
Year 1	56	58	64	77	70
Year 2	50	50	52	65	59
Year 3	45	44	45	57	55
Last year	41	37	32	47	47
Any marijuana use:					
Pre-DARP[1]	46	56	52	51	49
Post-DARP					
Year 1	58	62	69	60	67
Year 2	61	63	73	59	64
Year 3	61	63	72	61	64
Last year	62	64	72	62	64
Any other nonopioid use:[2]					
Pre-DARP[1]	54	60	54	57	48
Post-DARP					
Year 1	41	40	45	51	50
Year 2	39	39	41	48	43
Year 3	37	39	38	43	44
Last year	33	34	31	39	42
Any drug abuse treatment:					
Pre-DARP[3]	49	53	48	48	50
Post-DARP					
Year 1	38	32	33	40	43
Year 2	40	29	35	41	34
Year 3	40	30	28	43	32
Last year	42	31	26	38	38

NOTE: Use of illicit drugs after DARP was defined on the basis of maximum use reported during 1 or more months in each year.

[1]Pre-DARP drug use was based on the 2 months before admission to DARP.

[2]Does not include marijuana.

[3]Pre-DARP treatment was based on total time (i.e., lifetime) before admission to DARP.

TABLE 2.--Individual outcome measures for active opioid addicts before and after DARP, by DARP treatment groups (based on black and white males)--Continued

	Treatment group (percent)				
	MM (N=895)	TC (N=582)	DF (N=256)	DT (N=214)	IO (N=152)
Any jail or prison:					
Pre-DARP[4]	50	62	51	48	43
Post-DARP					
Year 1	28	33	34	35	41
Year 2	30	35	37	38	38
Year 3	30	32	36	34	38
Last year	28	30	34	36	36
Any arrests:					
Pre-DARP[4]	88	95	87	83	86
Post-DARP					
Year 1	27	32	34	38	39
Year 2	22	25	27	30	26
Year 3	20	23	22	25	23
Last year	20	21	24	24	21
Alcohol use--over 4 oz. of 80-proof per day:[5]					
Pre-DARP	21	20	21	18	19
Post-DARP					
Year 1	39	38	38	34	31
Year 2	36	36	41	37	32
Year 3	36	34	40	38	30
Last year	36	35	41	37	33
Alcohol use--over 8 oz. of 80-proof per day:[5]					
Pre-DARP	12	12	14	11	12
Post-DARP					
Year 1	23	21	23	22	18
Year 2	22	20	25	22	18
Year 3	23	21	24	25	19
Last year	22	20	26	23	19
Employed in 50 percent or more of months at risk:					
Pre-DARP[6]	33	20	24	33	21
Post-DARP					
Year 1	57	61	52	49	44
Year 2	59	67	61	50	54
Year 3	58	68	66	56	58
Last year	62	67	65	64	61

[4]Pre-DARP data were based on total time (i.e., lifetime) before admission to DARP.
[5]Alcohol use was defined by average daily consumption of combined beverages, and pre-DARP use was based on the 2 months before admission to DARP.
[6]Pre-DARP employment was based on the 12 months before admission to DARP.

TABLE 3.--Individual outcome measures for former opioid addicts and nonaddicts before and after DARP, by DARP treatment groups (based on black and white males)

	Former addicts (percent)		Nonaddicts (percent)	
	TC (N=251)	DF (N=100)	TC (N=133)	DF (N=191)
Daily opioid use:				
Pre-DARP[1]	0	0	0	0
Post-DARP				
Year 1	31	37	9	8
Year 2	23	29	6	7
Year 3	20	20	5	7
Last year	9	19	6	3
Any opioid use:				
Pre-DARP[1]	69	60	35	21
Post-DARP				
Year 1	48	62	30	27
Year 2	41	55	29	26
Year 3	38	39	24	24
Last year	23	34	17	17
Any marijuana use:				
Pre-DARP[1]	49	69	74	84
Post-DARP				
Year 1	60	79	70	80
Year 2	61	77	69	83
Year 3	62	77	73	79
Last year	61	74	71	76
Any other nonopioid use:[2]				
Pre-DARP[1]	54	53	81	83
Post-DARP				
Year 1	44	50	55	49
Year 2	41	47	47	47
Year 3	39	41	50	46
Last year	35	34	41	40
Any drug abuse treatment:				
Pre-DARP[3]	59	50	33	17
Post-DARP				
Year 1	30	17	15	14
Year 2	26	24	13	9
Year 3	25	16	13	8
Last year	19	16	10	6

NOTE: Only TC and DF treatment groups were large enough to permit meaningful analysis. Use of illicit drugs after DARP was defined on the basis of maximum use reported during 1 or more months in each year.

[1]Pre-DARP drug use was based on the 2 months before admission to DARP.

[2]Does not include marijuana.

[3]Pre-DARP treatment was based on total time (i.e., lifetime) before admission to DARP.

TABLE 3.--Individual outcome measures for former opioid addicts and nonaddicts before and after DARP, by DARP treatment groups (based on black and white males)--Continued

	Former addicts (percent)		Nonaddicts (percent)	
	TC (N=251)	DF (N=100)	TC (N=133)	DF (N=191)
Any jail or prison:				
Pre-DARP[4]	60	66	62	44
Post-DARP				
Year 1	29	29	23	25
Year 2	30	33	29	23
Year 3	31	27	21	23
Last year	26	23	20	20
Any arrests:				
Pre-DARP[4]	92	92	81	75
Post-DARP				
Year 1	29	31	22	27
Year 2	22	30	22	19
Year 3	23	20	19	16
Last year	19	17	15	17
Alcohol use--over 4 oz. of 80-proof per day:[5]				
Pre-DARP	24	28	31	34
Post-DARP				
Year 1	39	35	52	37
Year 2	37	34	52	36
Year 3	38	37	54	35
Last year	39	39	47	38
Alcohol use--over 8 oz. of 80-proof per day:[5]				
Pre-DARP	18	18	28	17
Post-DARP				
Year 1	24	17	34	20
Year 2	23	18	32	18
Year 3	25	19	33	18
Last year	24	24	31	21
Employed in 50 percent or more of months at risk:				
Pre-DARP[6]	19	20	32	34
Post-DARP				
Year 1	60	50	61	63
Year 2	66	56	71	66
Year 3	69	57	68	64
Last year	68	63	77	68

[4]Pre-DARP data were based on total time (i.e., lifetime) before admission to DARP.
[5]Alcohol use was defined by average daily consumption of combined beverages, and pre-DARP use was based on the 2 months before admission to DARP.
[6]Pre-DARP employment was based on the 12 months before admission to DARP.

Descriptive tabulations of individual outcome measures before and after DARP, presented in tables 2 and 3, are shown separately for addict and nonaddict subsamples within each DARP treatment group. Differences in the time intervals on which many of these pre-DARP and post-DARP measures are based limit the comparability of the data, but performance after DARP appeared to reflect prosocial changes from pre-DARP levels (except for alcohol and marijuana use). These data illustrate the findings of the various treatment effectiveness studies. Most of the DARP treatment evaluation research has focused on the post-DARP data (especially year 1), and the major findings of these studies are summarized below.

- Outcomes after DARP were significantly more favorable for MM, TC, and DF treatments than for DT and intake-only (IO) clients (especially on opioid drug use and overall composite outcome scores); these comparisons were adjusted statistically for individual background and baseline differences (Joe and Sells 1978; Sells et al. 1978; Sells and Simpson 1979, 1980; Simpson et al. 1977, 1980).

- The favorable outcomes for MM, TC, and DF treatments (compared to DT and IO) were apparent even in the very first month after DARP; client outcomes in the first month were also more favorable among clients who completed treatment than those who quit or were expelled (Simpson et al. 1979b).

- "Treatment types" defined within the MM, TC, and DF modalities on the basis of therapeutic philosophy and service delivery procedures (Cole and Watterson 1976) were not found to be related significantly to posttreatment outcomes of clients (Simpson et al. 1977, 1980; Simpson and Savage 1980).

- Comparisons of posttreatment outcomes of clients within each major treatment modality (i.e., examined separately for MM, TC, and DF treatment programs) showed no evidence of differential program effectiveness among DARP agencies (Joe et al. 1980).

- Among clients who were active opioid addicts at the time of admission to DARP, there were no reliable overall differences on empirically defined composite outcome scores between MM, TC, and DF treatments (Savage and Simpson 1981; Simpson et al. 1980).

- With respect to post-DARP opioid use, which is particularly relevant for those who were active addicts at admission, the results in table 2 reveal that 56 percent to 64 percent of the MM, TC, and DF clients had no daily use in the first year after treatment; this compares with 36 percent in DT and 47 percent in IO.

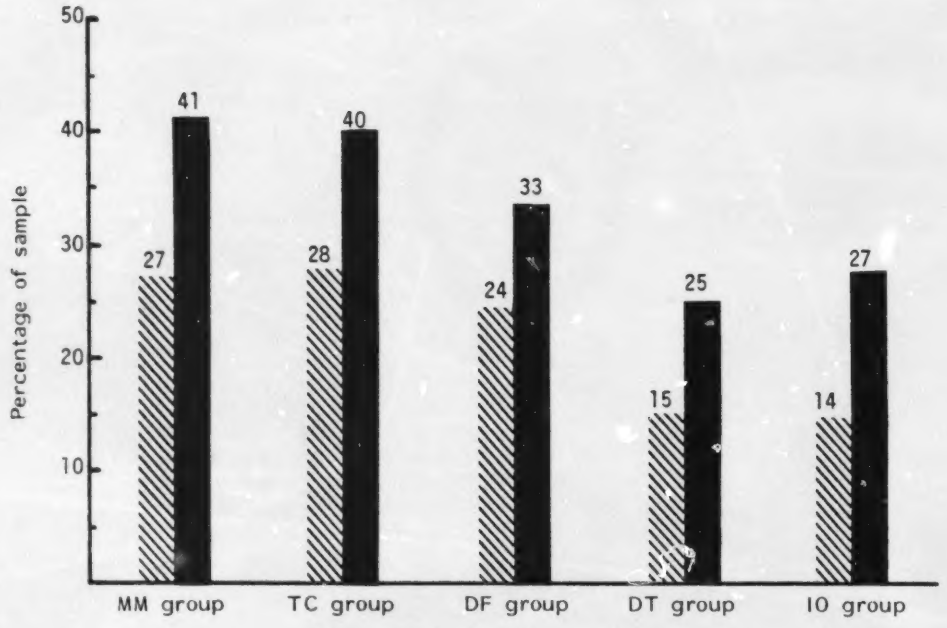
- Figure 2 (based on active addicts) illustrates that outcomes in year 1 after DARP were more favorable for MM, TC, and DF than for DT and IO. A highly favorable outcome standard--conjointly defined to represent no illicit drug use (except less-than-daily marijuana use) and no arrests or incarcerations--described 27 percent of MM, 28 percent of TC, and 24 percent of DF clients, compared to 15 percent of DT and 14 percent of IO clients; corresponding percentages were about 10 to 15 percent higher using a more moderately defined outcome standard. (See figure 2.)

- Treatment comparisons conducted separately for former addicts and nonaddicts showed that there were no statistically significant differences on composite outcome scores for TC and DF groups in the first year after DARP (Savage and Simpson 1981; Simpson et al. 1980); other DARP treatment groups could not be compared because of small sample sizes.

Separation of the followup sample according to types of drug users at the time of admission (i.e., active addicts, former addicts, and nonaddicts) and type of treatment received allows more refined descriptions and evaluations of posttreatment outcomes than is possible using the combined sample. Subdividing the data in this way indicated types of drug use as defined by pretreatment history of opioid and nonopioid drug use were related to followup outcomes. It also appears that active opioid addicts at admission had more problems during the followup period than nonaddicts.

Among active opioid addicts some treatment groups had significantly better outcomes than others. In particular, the results indicate that clients treated in MM, TC, and DF programs had more favorable outcomes than DT and IO clients. There were no significant differences in the comparative effectiveness of MM, TC, and DF treatments among these clients. In addition, there was no evidence of treatment-related differences in followup outcomes of either former opioid addicts or nonaddicts treated in TC versus DF programs.

FIGURE 2.--First year posttreatment outcomes for black and white male opioid addicts in each DARP treatment group



Highly favorable standard--No use of illicit drugs (except for less-than-daily marijuana use) and no arrests or incarcerations in jail/prison.

Moderately favorable standard--No daily use of illicit drugs and no major criminality (i.e., no more than 30 days in jail/prison and no arrests for crimes against persons or crimes of profit).

Prediction of Followup Outcomes Within Treatments

One of the issues the DARP followup evaluation research focused on was whether client background and during-treatment performance measures were related to (that is, could predict) post-DARP outcomes. Potential predicting factors were analyzed separately within each treatment group. It must be emphasized that these analyses did not address overall treatment impact or effectiveness; they, instead, focused on the general question of whether certain characteristics of clients were associated with relatively more or less favorable posttreatment outcomes.

There are many complications involved in interpreting results from treatment prediction studies. One such complication derives from the fact that the magnitude of the predictive relationships observed depends in part on the overall effectiveness of the treatment involved. For example, when treatment is highly effective, outcomes are uniformly good and variation among clients, regardless of background (predictor) differences, is low. On the other hand, when treatment is less than highly

effective, variation in outcomes may be greater (although not necessarily) and the possibility of stronger relationships between client characteristics and outcomes may exist.

Since quantitative adjustments for treatment effectiveness are not practical, the results of prediction studies must be interpreted with caution. In addition, the distributional properties of the variables that are usually included in such studies are often marginal (because of their lack of normality), and that tends to create additional statistical problems.

Notwithstanding these reservations, it is recognized that efforts to predict treatment outcomes are tempting and, in many circumstances, may serve legitimate and practical purposes. In the DARP evaluation studies, every effort was made to interpret the predictive results conservatively; in addition, the research was replicated across independent samples, representing clients from different admission cohorts as well as from different treatments. The major results from the DARP research on prediction of posttreatment outcomes are summarized below.

- Illicit drug use following treatment did not differ significantly between males and females, suggesting that treatment effects were not related to sex (Savage and Simpson 1978, 1981).

- In comparison to females, males reported higher post-DARP criminal involvement (particularly for more serious crimes, such as those against persons and for profit), alcohol consumption, and employment in a manner similar to that observed in the general population (Savage and Simpson 1978, 1979; Simpson 1979; Simpson and Lloyd 1979a).

- Some outcome differences were found between racial-ethnic groups, but they were confounded with differences in geographic region and sociocultural factors and therefore were not subject to straightforward interpretation (Savage and Simpson 1978).

- The best predictors of specific followup outcomes were pre-DARP measures on the same variable. For example, persons with more extensive criminal backgrounds were more likely to be involved in posttreatment criminal activities (Savage and Simpson 1979); persons with previous alcohol problems and heavier consumption before DARP also drank more after DARP (Simpson and Lloyd 1977, 1979a); and more post-DARP employment was reported by persons employed before DARP (Simpson 1979).

- Of all client background measures studied, the strongest and most consistent predictor involved the association of extensive criminal histories (defined by previous arrests and incarcerations) with unfavorable posttreatment outcomes, particularly with regard to opioid use, employment, and further criminal involvement (Neman et al. 1977; Simpson et al. 1977, 1980).

- Other variables that added significantly to the prediction of favorable posttreatment outcomes were favorable during-treatment performance (on drug use, criminality, and employment indicators), longer time in treatment, and completion of treatment (Savage and Simpson 1981; Simpson et al. 1977, 1980).

- Outcomes for clients in MM, TC, and DF programs receiving short-term treatment of less than 90 days (regardless of reason for termination) were relatively poor and not significantly different from clients of DT and IO groups; however, outcomes improved for longer periods of time in MM, TC, or DF groups in direct (linear) relation to the length of time spent in treatment (Simpson 1978, 1980). The relationship between length of time spent in treatment and outcomes is illustrated in figure 3. Readers wishing a more detailed exposition of this point should consult Simpson (1979).

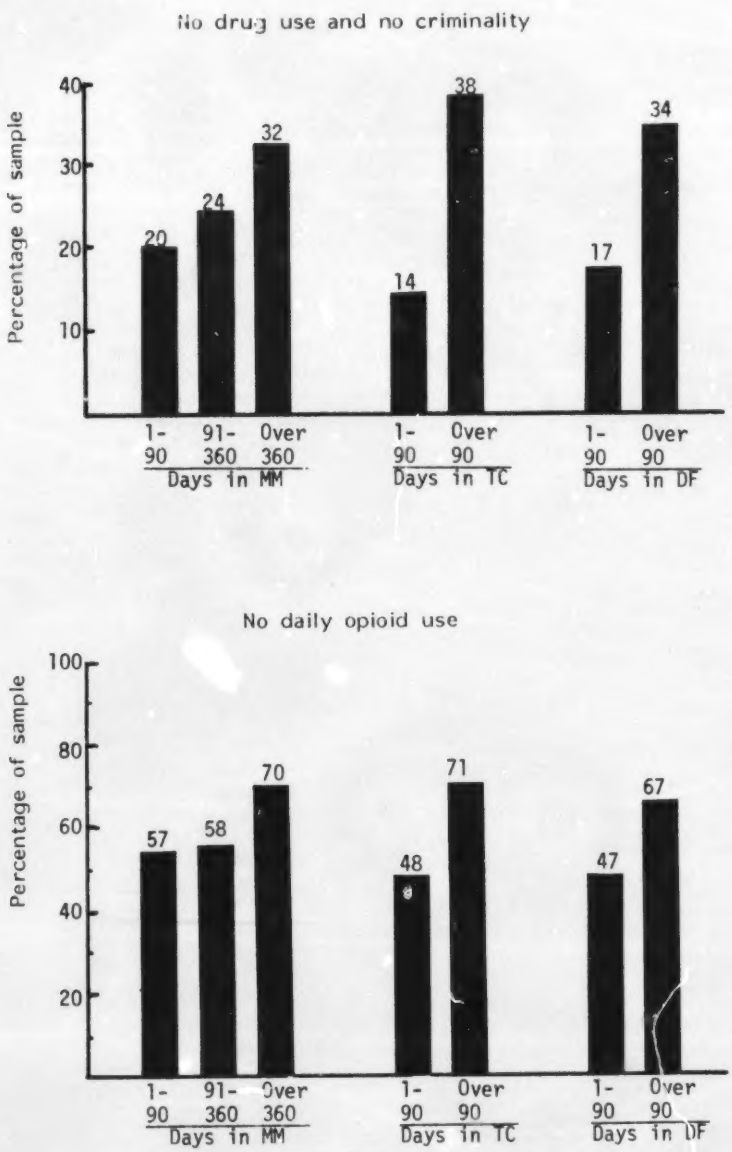
- There was no evidence that posttreatment outcomes for certain types of clients (defined on the basis of background characteristics, especially criminal history) were significantly better in some treatments than in others; thus, the data did not indicate that there was an optimal match for client types and treatment types (Simpson and Savage 1980).

The major predictors of posttreatment outcomes were pre-DARP criminal history and performance and length of time spent in treatment. The relationships of these variables with outcome measures tended to remain stable across the treatment groups and cohort samples studied. Such findings support the generalizability of the results and suggest that the predictors may reflect "treatability" in general, or the overall prognosis for recovery, even if no treatment were received (as in the IO group). This conclusion is also supported by the lack of evidence found for an optimal match of client type and treatment type.

COMMENTS

Results of the DARP followup studies suggest the attainment of effective results by the

FIGURE 3.--Outcomes in year 1 after DARP for active opioid addicts (at DARP admission) by length of time spent in MM, TC, and DF treatment groups (black and white males only)



major types of treatment for drug abuse. Specifically, methadone maintenance, therapeutic community, and outpatient drug-free programs were found to be associated with more favorable posttreatment outcomes than comparison groups of outpatient detoxification and intake-only clients. Furthermore, both performanace during treatment and length of time spent in treatment were found positively related to favorable outcomes. Those clients who remained in treatment less than 90 days derived less benefit from treatment on the average regardless of the modality entered.

It is important to note that these results were replicated using independent followup samples over time, and that the same findings held for treatment received after DARP. Studies focused on trends in outcome measures during the 4- to 5-year post-DARP followup period revealed that treatment episodes (and the length of treatment) were also closely associated with improvements in behavioral outcomes. In addition, changes in outcome measures representing illicit drug use, alcohol consumption, criminality, and productive activities (including employment) were interrelated during the followup period (e.g., see Savage and Simpson 1979, Simpson 1979, and Simpson and Lloyd 1979a).

The overall consistency of the DARP findings demonstrates that a strong connection exists between drug abuse treatment and posttreatment outcomes. As discussed in the DARP evaluation studies, however, causal interpretations of this relationship cannot be firmly established based on the present data because of possible confounding influences due to client differences (e.g., in motivation, self-selection of treatment, family and peer relations) that might interact with treatment effects per se. In any event, interpretation of treatment as well as of other possible factors as causal agents of favorable posttreatment outcomes is not presumed to be an "all or none" relationship. It is reasonable to expect that treatment is only one of a number of important factors that contribute to the rehabilitation of drug abusers, and that these factors are interrelated in a complex and perhaps idiosyncratic manner in different individuals.

Considering the complex, multivariate network of causal factors on posttreatment outcomes, one implication is that it is impractical (and economically infeasible) to resolve these issues through a program of controlled experiments. It is believed that long-term followup interviews with drug abusers are needed to identify some of the major significant causal factors and events in the addiction cycle, including the assessed impact of community-based drug abuse treatment programs funded during the last decade. Such research, currently scheduled, holds promise for answers to important questions that currently command attention in the drug abuse treatment field.

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